THE INSECT PEST SURVEY BULLETIN

Volume 18 | Supplement to No. 9 | December 28, 1938

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
UNITED STATES
DEPARTMENT OF AGRICULTURE
AND
THE STATE ENTOMOLOGICAL
AGENCIES COOPERATING

I N S E C T P E S T S U R V E Y B U L L E T I N

Vol. 18 | Supplement to Number 9 | December 28, 1938

RELATIVE ABUNDANCE OF THE EUROPEAN CORN BORER IN 1938[1/]

W. A. Baker and A. M. Vance
Bureau of Entomology and Plant Quarantine
United States Department of Agriculture

The relative abundance of the European corn borer (Pyrausta nubilalis (Hbn.)) in 1938 in several representative sections of the territory infested was determined by field surveys. Data on the status of the borer in corn generally was obtained in the fall by surveying fields selected at random over a wide area, whereas that on infestation in early market sweet corn was obtained by summer examinations of the earliest and most severely attacked fields in local sections of the country. Potato fields selected at random in three of the Eastern States were also surveyed for infestation by the first generation of the borer. In each case field methods tested in previous years were used.

For the fourth consecutive year since 1934, when a significant decrease in its abundance from 1933 occurred, the European corn borer has increased in numbers over an area west of Lake Erie comprising 6 counties in Michigan and 12 in Ohio. Comparative data on abundance of the borer in this area over a 12-year period are summarized in table 1. It should be noted that, in addition to the fluctuations just mentioned, a significant decrease had occurred in 1930, followed by an appreciable increase in 1931.

1/ Data on corn borer abundance in Indiana became available through cooperation with the State Conservation Department of Indiana, which in 1938 conducted an extensive survey of most of the infested territory in that State.

Table 1.--A 12-year comparison of average European corn borer populations in 18 comparable counties[1/] of Michigan and Ohio, 1927-38

Year	Average borers per 100 plants[2/]	Year	Average borers per 100 plants[2/]
	Number		Number
1927	21.3	1933	45.5
1928	17.1	1934	+15.6
1929	32.7	1935	±42.4
1930	+17.3	1936	±69.9
1931	±40.7	1937	±99.0
1932	48.6	1938	±129.5

1/ The counties involved are the same as those surveyed in Michigan and Ohio in 1938 and listed in table 2.

2/ +Indicates significant decrease; ±indicates significant increase.

The data obtained in the 1938 fall survey are presented in table 2, together with comparable data for 1937. The most important features characterizing the known abundance of the European corn borer in 1938, as determined by this survey, may be summarized briefly as follows:

(1) An increase of corn borer populations in the counties of Williams, Defiance, Paulding, Fulton, Henry, and Hancock, in northwestern Ohio, to numbers above any previously recorded in that section of the State.

(2) The maintenance of borer abundance at approximately the same level as in 1937 in the Ohio counties of Lucas, Wood, Putnam, Seneca, and Sandusky, and a decrease from 1937 in Ottawa County, Ohio.

(3) A significant decrease from 1937 in the counties of St. Clair, Wayne, and Monroe, in southeastern Michigan, with no change in Macomb, Washtenaw, and Lenawee Counties, Mich. However, toward the southwestern portion of the Michigan section, in Lenawee County, the occurrence of highly infested fields was more general than in other years of survey.

(4) An increase of a character similar to that in northwestern Ohio extending westward into 10 counties of northeastern Indiana, where populations were higher than found in any previous survey in this region, and the more extensive occurrence of the borer over most of the remaining territory infested in that State.

(5) The presence of higher infestations than in previous years in the county groups of Jefferson-Oswego and Chautauqua-Erie-Niagara in western New York.

(6) A rapid rise in infestation by the second generation of the borer in central New Jersey resulting in some of the highest populations in field corn yet observed in the United States, with notable increases over 1937 in Monmouth, Middlesex, and Burlington Counties.

Table 2.--Abundance of the European corn borer in the fall of 1938 as compared with 1937

State and County	Average borers per 100 plants in-- 1937	1938	State and County	Average borers per 100 plants in- 1937	1938
	Number	Number		Number	Number
Lake States			**Eastern States**		
Michigan			**Connecticut**		
Lenawee	147.9	206.4	Hartford	1077.2	1130.3
Macomb	178.6	191.2	New Haven	845.5	842.3
Monroe	215.9	124.8	District average	961.4	986.3
St. Clair	157.7	74.4			
Washtenaw	75.4	73.2	**New Jersey**		
Wayne	131.0	65.9	Monmouth	157.4	914.9
District average	151.1	122.7	Middlesex	38.1	536.1
			Burlington	86.0	818.3
Ohio			Mercer	-- -	639.7
Defiance	27.5	190.7	Camden-Gloucester	-- -	97.4
Fulton	67.1	272.3	District average 2/	93.8	756.4
Hancock	66.8	127.9			
Henry	66.4	188.8	**Delaware**		
Lucas	149.4	212.3	Sussex	5.9	7.9
Ottawa	99.9	41.6			
Paulding	31.4	77.1	**Maryland**		
Putnam	45.7	40.2	Wicomico-Worcester	11.4	8.9
Sandusky	89.3	104.3			
Seneca	101.8	81.8	**Virginia**		
Williams	33.1	136.5	Accomac-Northampton	73.1	10.8
Wood	96.4	122.3			
District average	72.9	133.0			
Indiana					
Adams-Blackford-Jay-Wells	4.4	65.9			
Allen-DeKalb-Steuben-Huntington-Noble-Whitley	3.1	15.8			
District average	5.3	49.1			
New York					
Jefferson-Oswego	21.2	215.6			
Chautauqua-Erie-Niagara	-- -	91.2			
District average	-- -	153.4			

2/ Based on first three counties.

(7) The continuance of the 1937 high levels of borer population in Hartford and New Haven Counties, Conn.

(8) A decrease from 1937 in numbers of the borer on the Eastern Shore of Virginia, with no significant change in the status of the insect in southern Delaware and the Wicomico-Worcester County section of the Eastern Shore of Maryland.

In 1938 early market sweet corn was severely damaged by the corn borer west of Toledo, in Lucas County, Ohio; near Sandusky, in Erie and Huron Counties, Ohio; and in the vicinity of New Haven, in New Haven County, Conn. Lighter infestations were observed in localities surveyed in Wayne County, Mich., Cuyahoga and Lorain Counties, Ohio, and the "Beverly district" in Burlington County, N. J. The relative abundance of the insect in this crop within the localities surveyed in 1938 and in the years 1934 to 1937, inclusive, are given in table 3. Corn borer infestation in early sweet corn plants near Toledo, Ohio, increasing each year since 1934, was practically 100 percent in 1938, with an average of 17.5 borers per plant in the 25 fields examined. In New Haven, Conn., sweet corn in the 25 early fields observed in 1938 was infested with an average of 8.8 borers per plant.

Table 3.--Abundance of the European corn borer in early market sweet corn in localities surveyed from 1934 to 1938[1/]

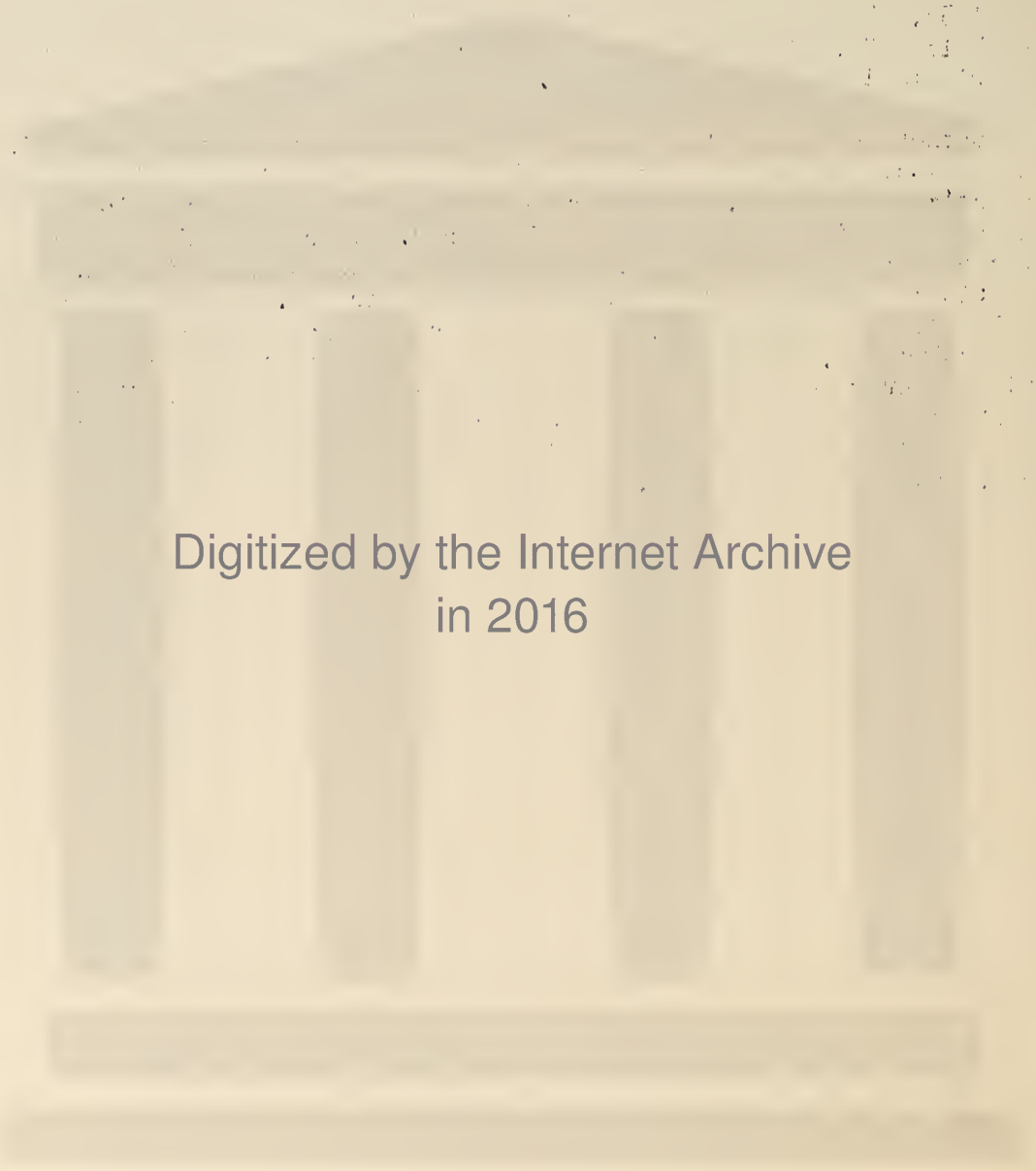
State and county	Average borers per 100 plants, in--		
	1934	1935	1938
	Number	Number	Number
Connecticut:			
New Haven	521 (21)	675	878
Hartford	446	225	--
Massachusetts:			
Middlesex	180 (14)	288	--
Bristol	135	--	--
Rhode Island:			
Newport-Bristol	175 (28)	385	--
Maine:			
York	--	117	--
New York:			
Suffolk	21 (11)	145 (20)	--
Nassau	9 (15)	--	--
Monroe	130 (29)	64	--
Orleans	126 (27)	--	--
Chautauqua	79	--	--
Jefferson	70	--	--
Wayne	--	112	--
New Jersey:			
Monmouth-Ocean	--	25	--
Burlington	--	--	50 (21)
Ohio:[2/]			
Lucas	268 (15)	328	1,751
Erie-Huron	--	--	1,128 (8)
Cuyahoga-Lorain	--	--	66 (10)
Michigan:			
Wayne	--	9 (20)	285 (10)

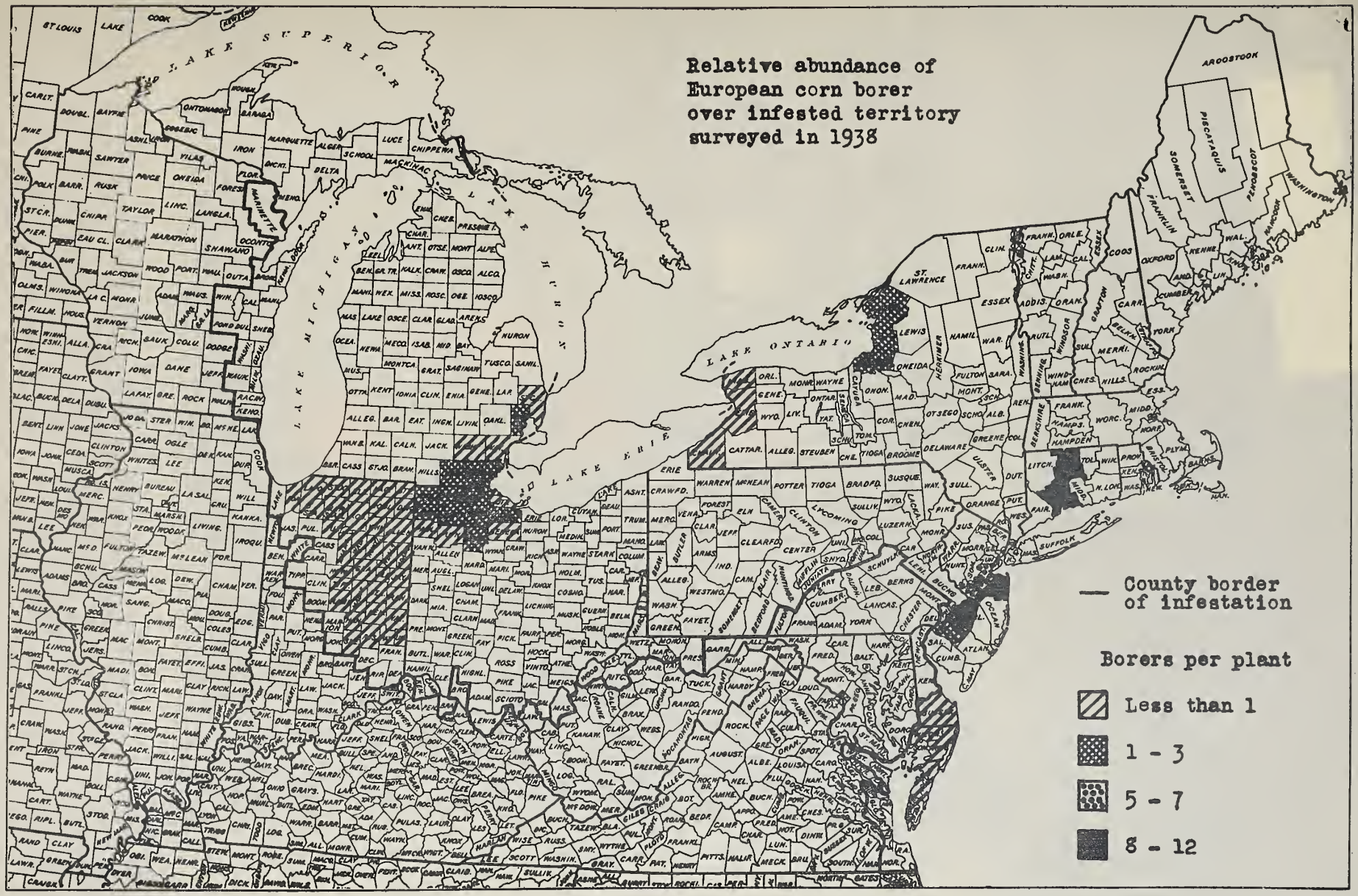
1/ Except as indicated otherwise by the figures given within parentheses, 25 fields were surveyed to obtain each population average. In each case the survey was confined to the earliest fields of sweet corn that could be found within a given locality.

2/ The average numbers of borers per 100 plants in this county in 1936 and 1937 were 469 and 794, respectively. No other localities were surveyed in these 2 years.

Increased infestation over that of 1937 of the first generation in white potatoes occurred in central Connecticut and west-central Massachusetts, with a decrease in abundance in this host plant on eastern Long Island, N. Y. In Connecticut the average number of borers per 100 plants in 1938 was 358, as compared with 106 in 1937; whereas in Massachusetts the average in 1938 was 280, as compared with 74 in 1937. On Long Island the decrease was from an average of 60 borers per 100 plants in 1937 to 30 in 1938.

Favorable weather for the corn borer prevailed in the Lake States in 1938, with adequate and well-distributed moisture in the field during the critical stages of the insect's development. Considerable corn in northwestern Ohio was planted late and was only lightly infested by the borer. In central New Jersey meteorological factors operated to the advantage of the second-generation borer and seasonal conditions in New England were generally favorable. Floods and a hurricane in the latter region, however, made necessary the abandonment of the fall survey in Massachusetts, although observations indicate that no direct effects on prevailing borer populations were associated with the storm. Weather extremes of drought and excessive precipitation during oviposition periods of the borer are believed to be responsible for the low populations recorded in Delaware, Maryland, and Virginia in 1938.




Relative abundance of
European corn borer
over infested territory
surveyed in 1938
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ONTARIO
LAKE ERIE
— County border of infestation
Borers per plant
Less than 1
1 - 3
5 - 7
8 - 12